

# 2024 CoastWatch & ATN Training

October 25, 2024 Virtual 10am - 5pm (Pacific Time)

## Resources

- [Coastwatch Tutorials \(on GitHub\)](#)
- [Coastwatch Lecture series](#)
- [Animal telemetry Network](#)

## Schedule

Time (PST)	Topic	Presenter
10:00 - 10:15	Training Overview - CoastWatch, ATN and the workshop component	<a href="#">Cara Wilson</a>
10:15 - 10:30	Group Introductions	<a href="#">Cara Wilson</a>
10:30 - 11:15	Coastwatch satellite datasets and data portals	<a href="#">Cara Wilson</a>
11:15 - 11:30	Break	
11:30 - 12:00	Using the ERDDAP data server	<a href="#">Cara Wilson</a>
12:00 - 12:30	Accessing ERDDAP using scripts (R, python)	<a href="#">Cara Wilson</a>
12:30 - 1:30	Lunch break	
1:30 - 2:00	Intro to ATN and the DAC	<a href="#">Megan McKinzie</a>
2:00 - 2:30	Demo of ATN data portal	<a href="#">Megan McKinzie</a>
2:30 - 3:00	Accessing public ATN datasets	<a href="#">Megan McKinzie</a>
3:00 - 3:15	Break	
3:15 - 3:30	Workshop, part 1: Linking CoastWatch and ATN data using <a href="#">scripts</a>	<a href="#">Daisy Shi</a>
3:30 - 4:45	Workshop, part 2: Hand's on time	
4:45 - 5:00	Wrap up and final discussion	All





# Introduction to NOAA CoastWatch and ATN Animal Telemetry Data Course

**Cara Wilson**

NOAA Southwest Fisheries Science Center, Monterey, CA  
PI of PolarWatch and West Coast node of CoastWatch

ATN Animal Telemetry Data Course - Oct 25, 2024

[coastwatch.info@noaa.gov](mailto:coastwatch.info@noaa.gov)





American Fisheries Society  
September 15-19, 2024  
Honolulu



## Training on accessing Oceanographic Satellite Data from NOAA CoastWatch and using the Animal Telemetry Network Portal

📅 Sat, September 14

🕒 8:00 AM - 5:00 PM

📍 303AB  
Conference Venue

🎓 Continuing Education  
Courses

### Description

Satellite and animal tracking data can be sources of important environmental observations for oceanographic applications. However, these data are often underutilized, primarily due to difficulties associated with verifying and accessing the data. In this training session participants will be familiarized with oceanographic satellite data products (sea surface temperature, chlorophyll concentration, sea level, ocean winds, and salinity) and satellite telemetry data. Participants will learn how to use the CoastWatch ODDAP data service through the portal and other web services to find, visualize, subset and download data. Techniques to match up telemetry data to satellite measurements will be provided. The training session will be a mix of lectures, demonstrations and hands-on tutorials in R, Python and ArcGIS.

### Instructors:

- Davy Hui Shih, NOAA CoastWatch/University of Hawaii
- Megan McKinnon, Monterey Bay Aquarium Research Institute
- Dale Robinson, University of California-Santa Cruz
- Cara Nelson, NOAA Southwest Fisheries Science Center

Has been rescheduled to be offered (free) as an online course:  
Friday October 25, 10am - 5pm PST

<https://coastwatch-training.github.io/CoastWatch-Workshops/courses/afs24.html>



# Animal Telemetry Network



The ATN data management vision includes a regionally distributed data collection, management and sharing capacity that builds on and integrates as many existing data links as possible to enable local and regional needs to be addressed. At the heart of this system is a centralized data assembly center (DAC) currently located at Axiom Data Science. This DAC is a community resource where regional telemetry data is aggregated in a single place and one-stop-shopping is provided for access to all U.S. national animal telemetry data. The DAC both serves national stakeholder needs effectively as well as enables cost/time savings to principal investigators.

## Quick Links

[Covering ARGOS Fees through the ATN](#)



# NOAA CoastWatch is a national program funded by NOAA/NESDIS<sup>1</sup>

**MISSION: PROVIDE ACCESS TO AND PROMOTE THE USE OF SATELLITE DATA PRODUCTS**  
for oceanic, freshwater, & polar applications

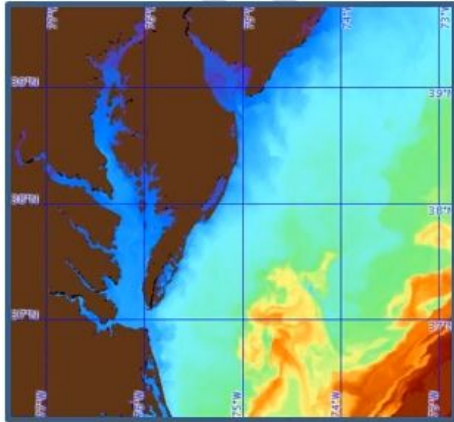


<sup>1</sup>National Environmental Satellite, Data, and Information Service

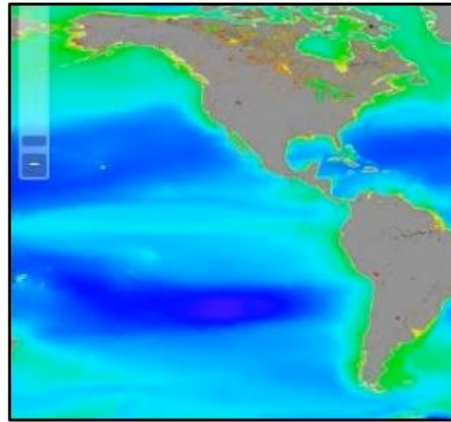




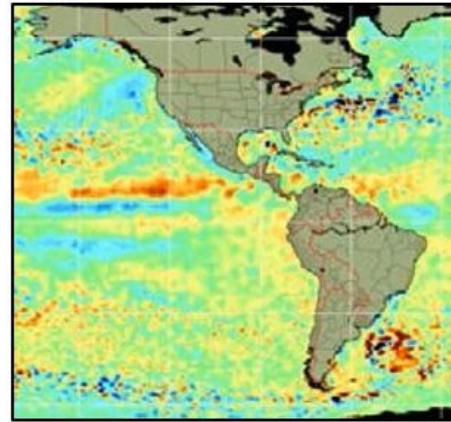
# CoastWatch distributes ocean satellite data



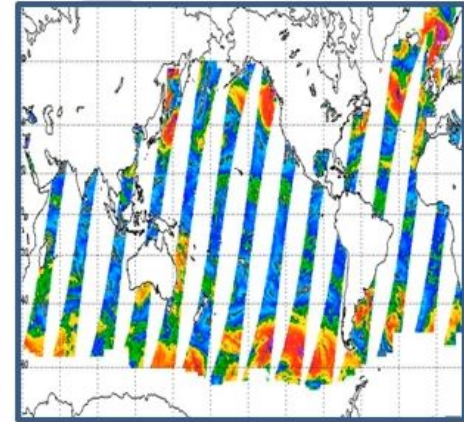
Temperature



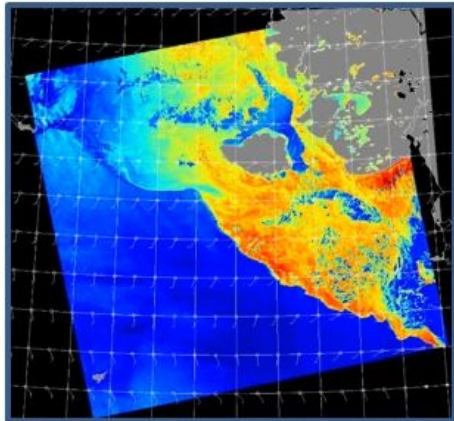
Ocean Color



Altimetry



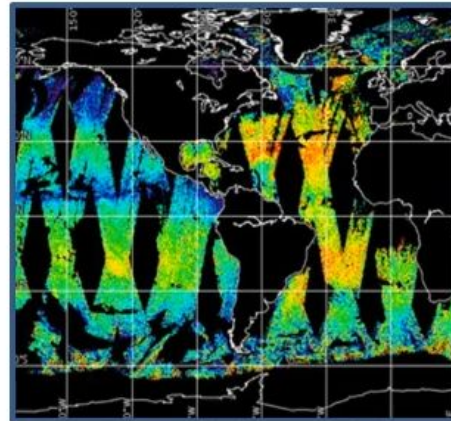
Ocean Vector Winds



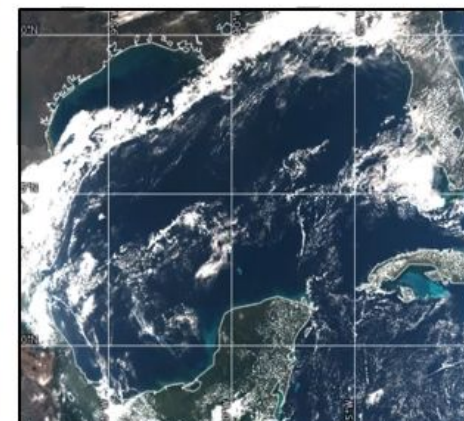
Synthetic  
Aperture  
Radar



Sea Ice



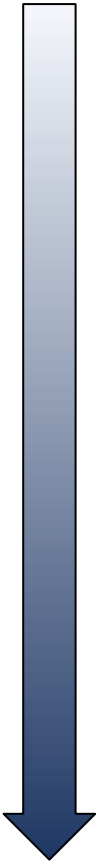
Salinity



Imagery

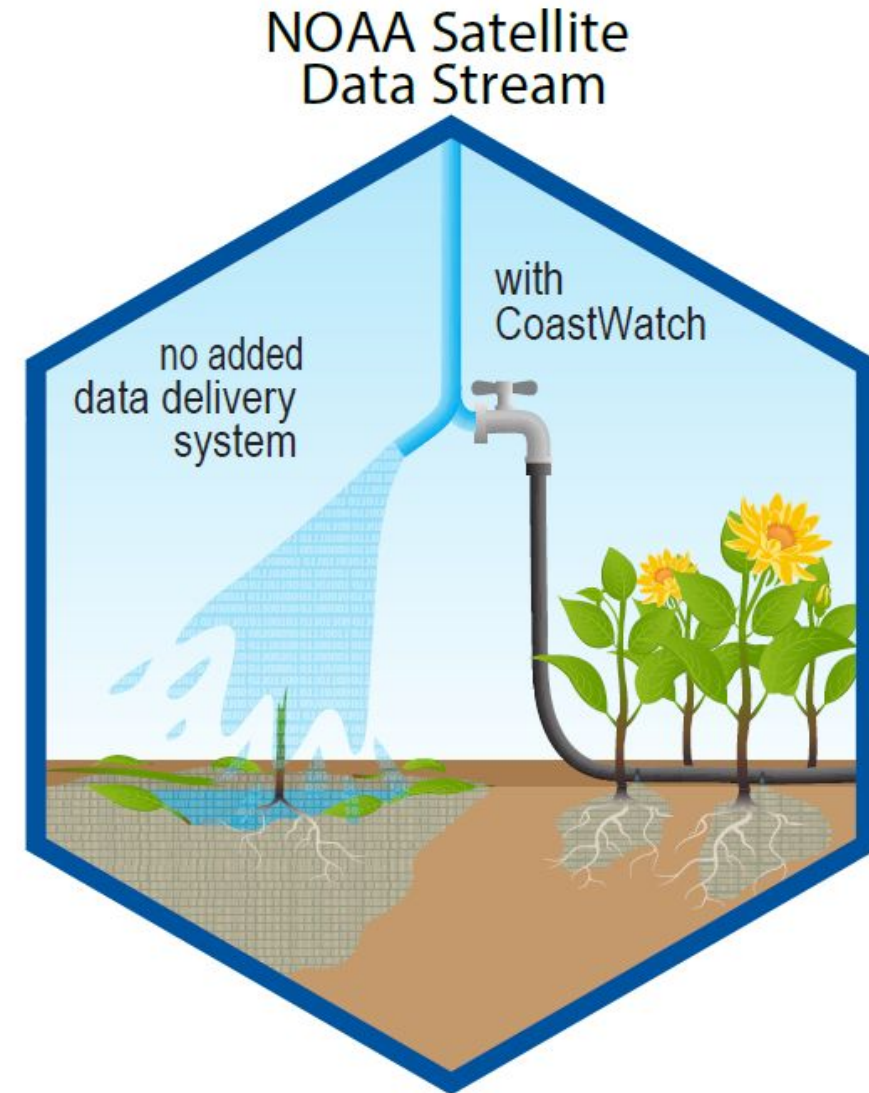
# CoastWatch offers several levels of service to help users with satellite data

INCREASING  
ASSISTANCE TO USER



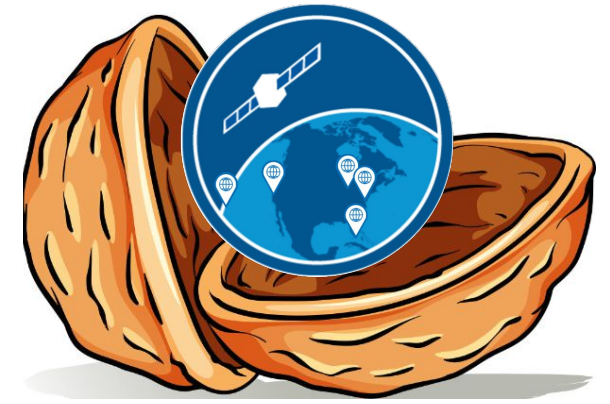
- Provide access to datasets with data servers
- Develop tools and tutorials to help users interact with the server and use the data
- Provide training and hands-on assistance
- Find or create products and tools to address users needs
- Work directly with users on projects

COASTWATCH IS A VALUE ADDED PROVIDER





# NOAA CoastWatch Resources in a Nutshell



- Easy access to satellite datasets using ERDDAP
- Online (short, ~20 minutes) videos explaining the basics of all the satellite products (SST, ocean color, sea surface height, etc.)
- Code notebooks in R and Python on GitHub to demonstrate basic data extraction (from ERDDAP) and plotting examples
- Periodic courses offered on understanding and accessing satellite data
- Helpdesk: [Coastwatch.info@noaa.gov](mailto:Coastwatch.info@noaa.gov)

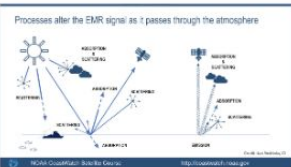


# Recorded Lectures are Available on the CoastWatch Learning Portal

Presently housed on the University of Maryland learning management system :

<https://umd.instructure.com/courses/1336575/pages/all-lectures>

All lectures are available as audio-recorded PowerPoint files, videos or transcripts.



Processes after the EMR signal as it passes through the atmosphere

NOAA CoastWatch Satellite Course

### Satellite 101

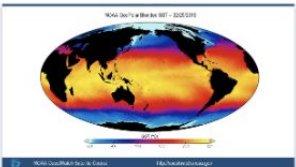


Ocean color data products

- Ocean color remote sensing applications at various scales
- Diffuse attenuation coefficient of chlorophyll *a* (Kd) and other parameters
- Ocean color remote sensing applications at various scales
- Various regional products (PAC, IOP, and more)


NOAA CoastWatch Satellite Course

### Ocean Color



NOAA CoastWatch Satellite Course

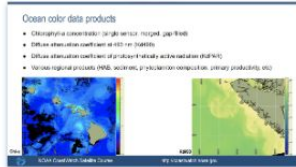
### Sea Surface Temperature



Ocean features can be tracked with wind data

NOAA CoastWatch Satellite Course

### Sea Surface Height, Winds, Salinity



Ocean color data products

- Oceanographic observations for light, water, and other parameters
- Diffuse attenuation coefficient of phytoplankton (Kd) and other parameters
- Various regional products (PAC, IOP, and more)

NOAA CoastWatch Satellite Course

### Water Quality



Datasets: Sea Ice Properties

- Sea Ice Concentration
- Sea Ice Thickness
- Ice Type/Age
- Ice Edge

NOAA CoastWatch Satellite Course

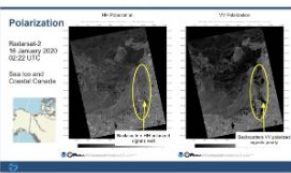
### Sea Ice



HAB detection using satellite

NOAA CoastWatch Satellite Course

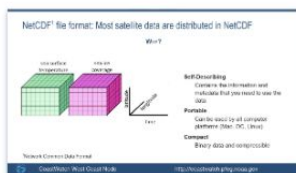
### HABs



Polarization

NOAA CoastWatch Satellite Course


### Synthetic Aperture Radar (SAR)



NetCDF file format: Most satellite data are distributed in NetCDF

NOAA CoastWatch Satellite Course

### Tools & Strategy



Balance the Needs of Your Project

NOAA CoastWatch Satellite Course

### Selecting a Dataset

# Tutorials are Available on the CoastWatch Learning Portal

Presently housed on the University of  
Maryland learning management system :

<https://umd.instructure.com/courses/1336575/pages/all-lectures>

The image shows a screenshot of the CoastWatch Learning Portal. At the top is a navigation menu with the following items: Home, Training Classes, Lectures, Tutorials, Example Applications, User Forums, Help, and CoastWatch. Below the menu is the text "Step-by-step instructions, exercises, User Guides, and videos." Below this text is a grid of nine tutorial cards. Each card contains a small screenshot of the tutorial's interface and a title. The titles are: ArcGIS, CoastWatch Data Portal, CoastWatch Utilities, ERDDAP, Matlab, Panoply, Python, and R. The Python and R cards have a large red 'X' overlaid on them, indicating that the most up-to-date versions are not available on the portal. To the right of the grid, there is a red text block that says "most up-to-date versions for Python and R are on GitHub".

Home Training Classes Lectures Tutorials Example Applications User Forums Help CoastWatch

Step-by-step instructions, exercises, User Guides, and videos.

ArcGIS

CoastWatch Data Portal

CoastWatch Utilities

ERDDAP

Matlab

Panoply

Python

R

most up-to-date versions for Python and R are on GitHub

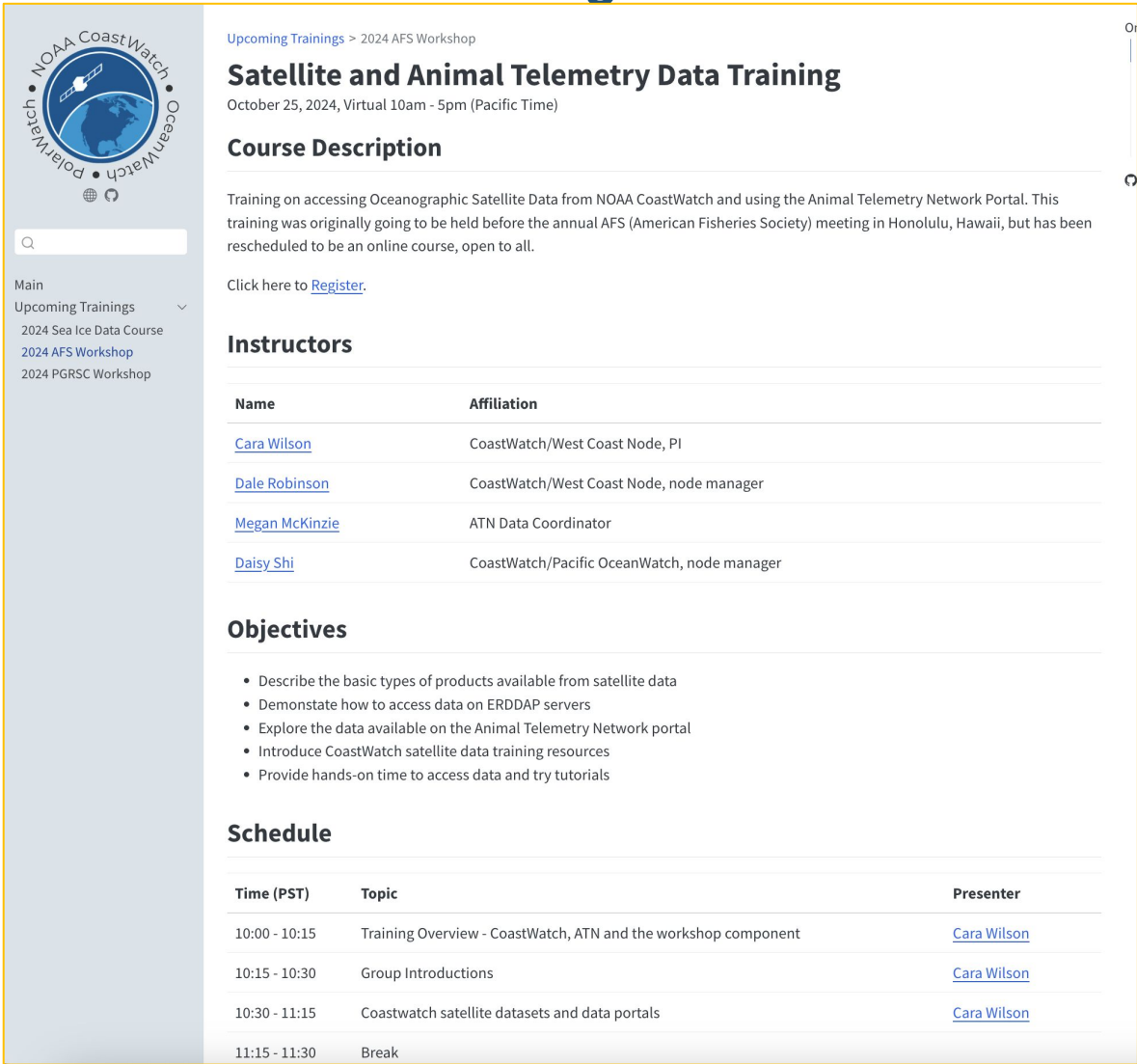


# Distribution of CoastWatch Courses is Transitioning to GitHub

## Upcoming Trainings:

Oct 25, 2024 - Animal Telemetry  
online, 10 am-5 pm PST

Nov 26, 2024 - PGRSC  
in person, 1-6 pm Fiji Time



The screenshot shows a webpage for an upcoming training. The header includes the NOAA CoastWatch logo and navigation links. The main content area is titled 'Upcoming Trainings > 2024 AFS Workshop' and features the course title 'Satellite and Animal Telemetry Data Training' with the date and time 'October 25, 2024, Virtual 10am - 5pm (Pacific Time)'. Below this is a 'Course Description' section, followed by an 'Instructors' table, an 'Objectives' list, and a 'Schedule' table.

**Course Description**

Training on accessing Oceanographic Satellite Data from NOAA CoastWatch and using the Animal Telemetry Network Portal. This training was originally going to be held before the annual AFS (American Fisheries Society) meeting in Honolulu, Hawaii, but has been rescheduled to be an online course, open to all.

Click here to [Register](#).

**Instructors**

Name	Affiliation
<a href="#">Cara Wilson</a>	CoastWatch/West Coast Node, PI
<a href="#">Dale Robinson</a>	CoastWatch/West Coast Node, node manager
<a href="#">Megan McKinzie</a>	ATN Data Coordinator
<a href="#">Daisy Shi</a>	CoastWatch/Pacific OceanWatch, node manager

**Objectives**

- Describe the basic types of products available from satellite data
- Demonstate how to access data on ERDDAP servers
- Explore the data available on the Animal Telemetry Network portal
- Introduce CoastWatch satellite data training resources
- Provide hands-on time to access data and try tutorials

**Schedule**

Time (PST)	Topic	Presenter
10:00 - 10:15	Training Overview - CoastWatch, ATN and the workshop component	<a href="#">Cara Wilson</a>
10:15 - 10:30	Group Introductions	<a href="#">Cara Wilson</a>
10:30 - 11:15	Coastwatch satellite datasets and data portals	<a href="#">Cara Wilson</a>
11:15 - 11:30	Break	

<https://coastwatch-training.github.io/CoastWatch-Workshops/>





# Distribution of CoastWatch Tutorials is Transitioning to GitHub

The R and python code on GitHub are the most up-to-date versions.

## Tutorial Module Descriptions

- [ERDDAP-basics](#) An introduction to what ERDDAP is and an overview of the different CoastWatch ERDDAP servers. Learn how to visualize and download data from ERDDAP, and how to interpret an ERDDAP url.
- [netcdf-and-panoply-tutorial](#) Learn how to use NASA's Panoply software to open and view netCDF data.
- [Tutorial1-basics](#) Learn to access satellite data from CoastWatch ERDDAP data server and to work with NetCDF files. Visualize sea surface temperature on a map and plot time series data. R and python versions.
- [Tutorial2-timeseries-compare-sensors](#) Learn common ways to download data from ERDDAP servers to access time-series chlorophyll data from four different satellite datasets and summarize and visualize the data for comparison. R and python versions.
- [convert-180+180-to-0-360-longitude](#) Work with datasets with  $-180^{\circ}$  to  $+180^{\circ}$  longitude values in a region that crosses the antimeridian. Convert the coordinates from  $(-180, +180)$  to  $(0, 360)$  and visualize data on a map. Python only.
- [create-virtual-buoy-with-satellite-data](#) Create a “virtual” buoy using satellite data to fill the gaps in in-situ data collected by a physical buoy. Extract data from a location close to an existing buoy. Clean dataset by removing outliers, and aggregate (resample) to achieve a reduced temporal resolution. Plot time series data. R and python versions.
- [extract-satellite-data-within-boundary](#) Extract sea surface temperature satellite data for a non-rectangular geographical region from an ERDDAP server using a shapefile, make maps, and plot a timeseries of the seasonal cycle of SST within the boundary. R and python versions.
- [matchup-satellite-buoy-data](#) Temporally and geospatially subset satellite data to match with buoy data (tabular), run statistical analysis and produce a map of the satellite data with overlaying buoy data. R only.
- [matchup-satellite-data-to-track-locations](#) Extract satellite data along a set of points defined by longitude, latitude, and time coordinates like that produced by an animal telemetry tag, a ship track, or a glider track. R and python versions.

<https://github.com/coastwatch-training/CoastWatch-Tutorials>



Questions?  
[Coastwatch.info@noaa.gov](mailto:Coastwatch.info@noaa.gov)

Learning Portal has links to recorded lectures and tutorials

Subscribe to our newsletter for announcements for satellite classes:

[subscribe](#)

coastwatch.noaa.gov

The screenshot shows the NOAA CoastWatch website homepage. At the top, there is a navigation bar with the NOAA logo and links for Home, Find Data, Data Tools, Education, News, Nodes, Partners, and About Us. A search bar is located on the right. Below the navigation bar, a "Welcome to NOAA CoastWatch" message is displayed, followed by a brief description of the organization's mission. The main content area features a grid of icons for various services: Search Data Products, Data Portal, Learning Portal (circled in green), Data Access Tools, User Stories, and NOAA Regional Nodes. Below this grid is a section titled "Explore Data By Application" with sub-sections for Climate & Weather, Ecosystem Monitoring, Fisheries & Aquaculture, Ocean & Coastal Dynamics, Transportation & Safety, and Water Quality. On the right side, there is a "Help Desk Support" section with contact information, a "Recent News" section with a list of updates, and a "Training Courses" section with details about upcoming workshops and satellite courses. A green arrow points from the "Learning Portal" icon to the "Training Courses" section, and another green arrow points from the "Subscribe to Our Newsletter" button to the "subscribe" text in the slide.



We will be using Slido to interact with participants:

Go to [www.slido.com](https://www.slido.com)

#ATN





# 2024 CoastWatch & ATN Training

October 25, 2024 Virtual 10am - 5pm (Pacific Time)

## Resources

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2:00 - 2:30	Demo of ATN data portal	<a href="#">Megan McKinzie</a>
2:30 - 3:00	Accessing public ATN datasets	<a href="#">Megan McKinzie</a>
3:00 - 3:15	Break	
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3:30 - 4:45	Workshop, part 2: Hand's on time	
4:45 - 5:00	Wrap up and final discussion	All

